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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/922,973	08/06/2001	Theodore M. Bloomstein	101328-160	1445
21125	7590	01/14/2004	EXAMINER	
NUTTER MCCLENNEN & FISH LLP WORLD TRADE CENTER WEST 155 SEAPORT BOULEVARD BOSTON, MA 02210-2604			SAGAR, KRIPA	
			ART UNIT	PAPER NUMBER
			1756	

DATE MAILED: 01/14/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/922,973

Applicant(s)

BLOOMSTEIN ET AL.

Examiner

Kripa Sagar

Art Unit

1756

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 10 October 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 10/10/03.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

## DETAILED ACTION

### Response to Amendment

1. Applicant's amendment filed 10/10/03 has been entered. Claims 1,6,12 have been amended; claim 13 has been newly added. No new matter has been introduced. Claims 1-13 are under consideration.

### Double Patenting

2. Claim 12 of this application conflicts with claim 19 of Application No. 09922974. 37 CFR 1.78(b) provides that when two or more applications filed by the same applicant contain conflicting claims, elimination of such claims from all but one application may be required in the absence of good and sufficient reason for their retention during pendency in more than one application. Applicant is required to either cancel the conflicting claims from all but one application or maintain a clear line of demarcation between the applications. See MPEP # 822.

Applicant's response does not conform to the requirements for overcoming the double patenting rejection. Confirmation of the cancellation of the claim from the conflicting application is required.

*See the interview.*

*Claim 19  
of 9-74 has  
been cancelled.*

### Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1,2,4-8,11-13 are rejected under 35 U.S.C. 102(b) as being anticipated by US Pat. 5753171 to Serbin et al.

The claims recite a method of modulating the exposure beam of a multilayered resist and forming a multilayered resist pattern by varying the spot size of a radiation beam during a scanning exposure.

Serbin teaches all the elements of the instant claims. It teaches predefining the pattern shape and storing it in the beam control unit (5;22-23). The resist layer is repeatedly deposited and patterned; the beam spot size is varied during the exposures (5;24-31). It teaches varying the spot size from the perimeter to the interior (4;19-47). The perimeter is exposed with a finer beam (4;66-5;17). Each discrete region within a layer is exposed to different spot sizes (Fig.3). The spot size is measured and compared to computed [cl.4] values (4;13-18, 4;56-65). The invention is related to stereo lithography wherein the solidified portions form the three-dimensional pattern and are retained while the unsolidified portions are removed (1;13-44). Serbin solidifies the portions by exposure (negative resist) [cl.8].

#### ***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1,3,6-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Pat.5496683 to Asano in view of prior art admitted by Applicant.

The claims recite a method of modulating the exposure of a multilayered resist and forming a multilayered resist pattern by varying the spot size of a radiation beam during a scanning exposure.

Asano teaches predefining the pattern to be exposed in each layer of a multilayered resist pattern (4;15-19). It teaches repeated deposition and exposure of the resist layers (4;5-14). Asano teaches that varying the spot size during scanning exposure is known in prior art (2;46-49). Thus Asano teaches most of the elements of claims 1,6,7.

Asano does not teach using a positive resist (cl.3, 8,10), developing the resist (cl.8), using a novolac resist (cl.11) and heating the resist (cl.9).

Applicant admits that these are known in prior art. The resist materials listed include DNQ/novolac (p.13;l.5); positive tone resists provide advantages that are well known in prior art and development is routinely carried out on patterned photoresist layers (p.13; l.10-20). Applicant notes that a post exposure bake (PEB) is common in resist processing (p.19;l.1-2).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the conventional processes of prior art with Asano's stereo lithographic process because the development of exposed resists and PEB provide a reasonable expectation of successfully forming the three-dimensional pattern.

***Response to Arguments***

6. Applicant's arguments with respect to claims 1-12 have been considered but are moot in view of the new ground(s) of rejection.

***Conclusion***

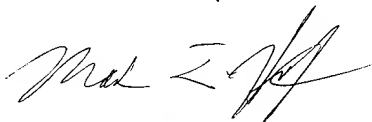
7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

US Pat. 5182056 to Spence et al. teaches every element of the instant claims — except the modulation of the beam and the use of positive tone resists

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kripa Sagar whose telephone number is 571-272-1392. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark F Huff can be reached on 571-272-1385. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.



MH/ks

MARK F. HUFF  
SUPERVISOR, PATENT EXAMINER  
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